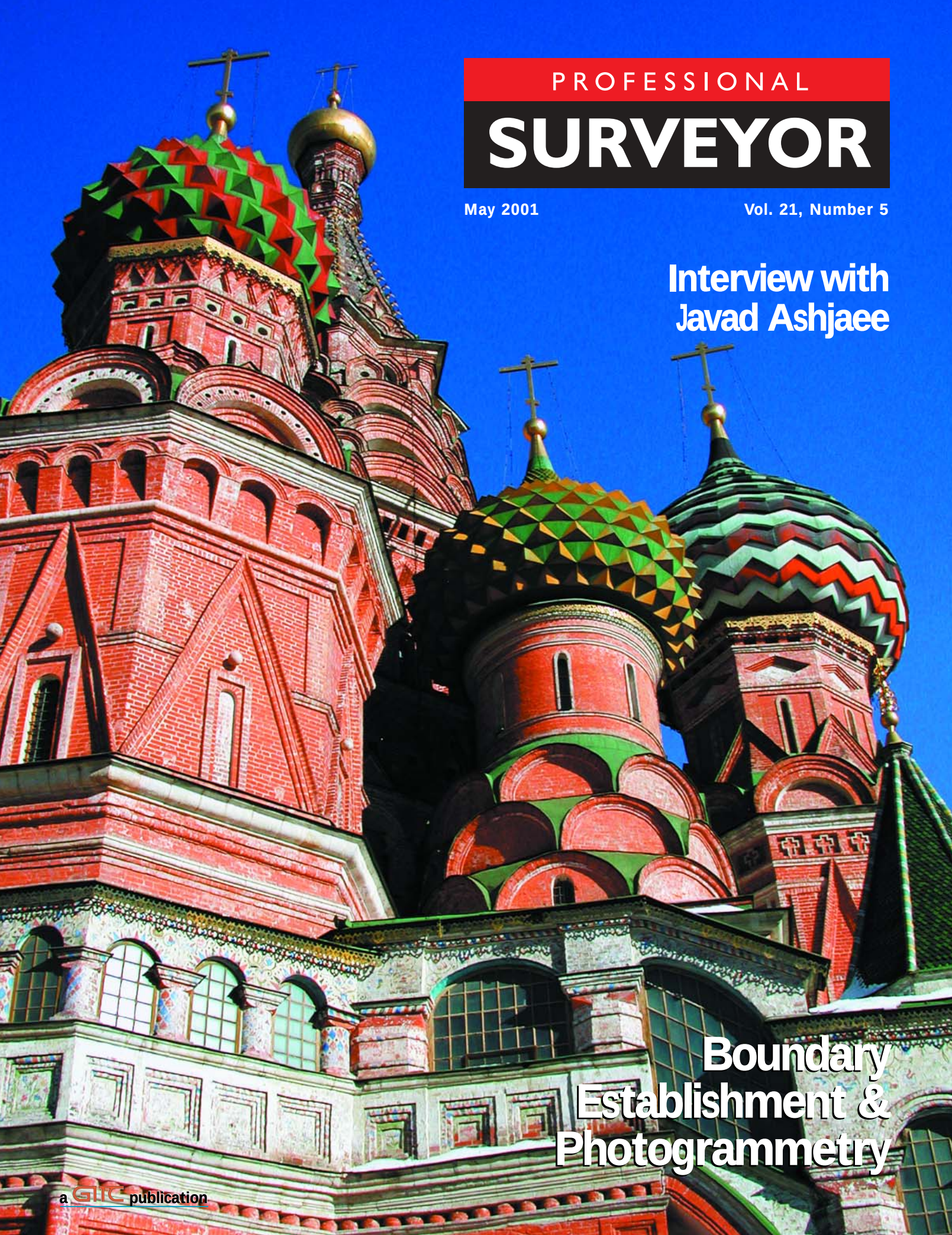


PROFESSIONAL
SURVEYOR

May 2001 Vol. 21, Number 5

Interview with Javad Ashjaee

Boundary Establishment & Photogrammetry

a GITC publication

"Number One in the World,

Second to None"

Much has changed in Javad Ashjaee's life since he first arrived in America in 1972, but one thing has remained constant: his desire to manufacture products that are "number one in the world, second to none." With the recent limited acquisition of Javad Positioning Systems (JPS) by Topcon Positioning Systems (TPS) for the precision markets, Javad completed yet another chapter in what qualifies as a true American success story.

We visited Red Square on a Saturday, and a group of elderly pensioners was demonstrating for a return to Communism. The words on the banner mean "Working Capital," and refer to the die-hard belief that things were better under Communism. The thing that was most striking about this was the fact just over a decade ago, demonstrations such as this would not have been permitted.

Marc Cheves, LS

Twelve years ago, the former editor of *Professional Surveyor*, Nick Harrison, traveled to the courthouse in San Jose to attend the citizenship ceremony as Javad and 121 other immigrants from 29 countries declared their oaths of allegiance to the United States. (See "PS Talks with Javad Ashjaee," March/April 1989). We caught up with Javad again at the March 2000 ACSM Convention in Little Rock, where we had dinner with him and several of his employees. As the evening progressed, several people started sharing details about Javad's life. Tales of intrigue and terror spilled out. At one point, someone made the comment, "They could make a movie about his life." It was then I decided that these many years later, readers might well enjoy a follow-up interview, which I conducted at the ION conference in Salt Lake City last Fall.

Holding a bachelors degree in electronic physics from the University of Teheran in Iran, and after two years mandatory service in the Iranian Royal Armed Forces as a lieutenant in the artillery, Javad first arrived in the United States in 1972 at age 22. Not surprisingly, he was met by numerous experiences of culture shock upon his enrollment in graduate school at the University of Iowa at Iowa City. Expecting cold temperatures, his first surprise was the intense heat of an Iowa Summer. Iowa City's population of 70,000 included approximately 40,000 students. Javad

This cannon resides inside the Kremlin, and has never been fired. The cannon balls are almost one meter in diameter.

spent his first Christmas holiday break alone, and ruefully recalls thinking that the only ones left in town were foreigners and stray dogs. He also remembers the time one of his professors referred to an electronic circuit as a "super-duper" filter. Although he had no idea what the term "duper" meant, he assumed it must be significant, and feared being deported if his professor found out that he had no knowledge of "Duper Filters." It took the assistance of a PhD from India to educate him in the field of slang terms. Before he left Iowa City, the industrious "newcomer" had received masters degrees in both math and electrical engineering (EE), as well as a PhD in EE.

Political Views Questioned

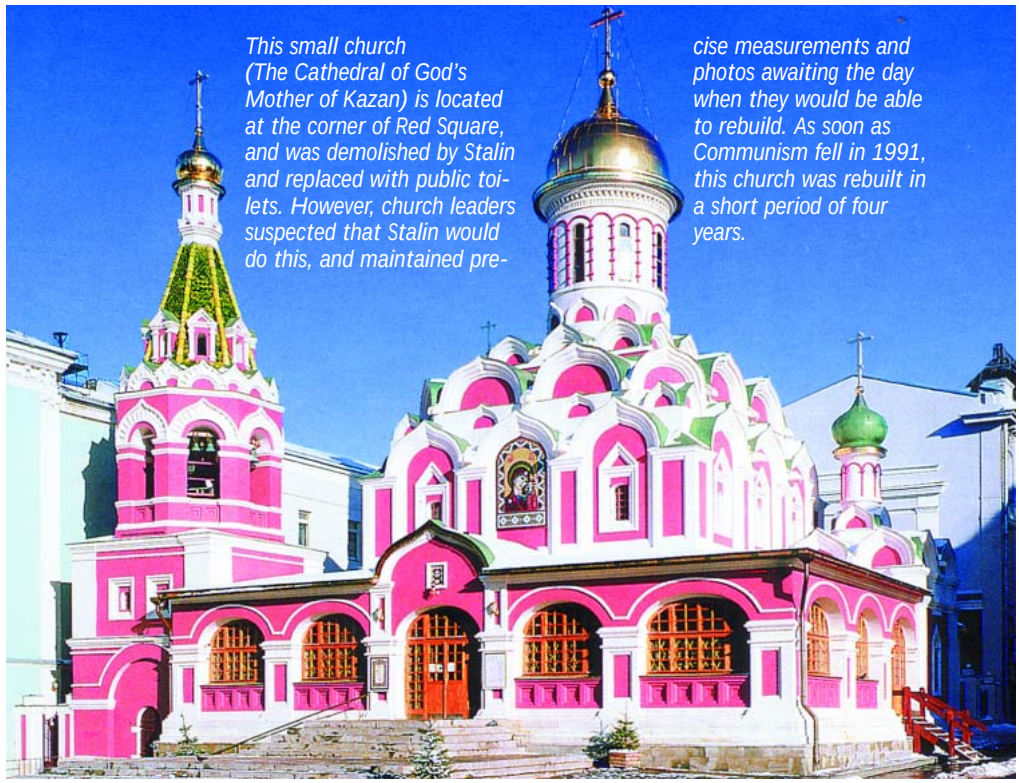
Javad returned to Teheran to teach in 1976, and became chairman of the Department of Computer Engineering at the Aryamehr University of Technology where he founded and managed a UNIVAC-100 computer center. There, he created the first Iranian microprocessor lab. In 1978 he created one of the earliest student online and interactive registration systems in the world.

It is during this time that President Carter was in office and political relationships between the U.S. and Iran were deteriorating. Following the overthrow and exile of Muhammad Reza Shah Pahlavi by Islamic revolutionaries, the American embassy in Tehran was seized by a large crowd of Iranian students on November 4, 1979. The U.S. responded by freezing billions of dollars in Iranian assets and by stopping oil imports from Iran. With the Ayatollah Khomeni in power, tensions continued to mount, and Javad, along with five other members of the Faculty Senate, disagreed with the new university policies, and was placed under surveillance by the Revolutionary Guards. In April of 1980 the U.S. failed in its attempt to rescue the embassy hostages by helicopter, and it was not until the following year, in late January of 1981 that the newly elected President Reagan announced the release of Iranian assets in the U.S. and the hostages gained their freedom.

Hopes of Escape

In 1981, Javad's father sought medical care at Stanford University for eye surgery, and Javad applied for permission to accompany him. Obtaining an exit visa was almost impossible, however. Because the U.S. Embassy had been closed, Javad applied for the necessary papers at the Swiss Embassy. When the call finally came announcing that his visa had been approved, he had only one hour in which to pick up the document and go through a series of formalities. The crush of impossible traffic necessitated a circuitous and adrenalin-charged drive through the city, driving on sidewalks and across people's lawns, and ruining reverse gear in the process. Worried that his name had been given to the airport authorities, Javad knew that he either had to get out of the country or face unknown consequences. At last he reached the airport, though the sense of terror continued. There he recognized three colleagues who were also trying to leave the country. Each studiously ignored the other. With a sense of freedom so close and the plane about to leave, Javad's hopes of escape were once again diminished when the guard examining his papers announced that he was missing a needed stamp. Surely, he thought, this was the end of the line. Yet another stroke of providence or fate moved the guard to permit him to let the young scientist board the plane. Javad's heart continued to pound when he took his seat and noticed from the window that several cars had just come came racing up to the plane. More tense moments passed, but it turned out they were there for some other reason. Finally, Javad was able to leave Iran.

Following his return to the U.S., Javad secured permission to work and started looking for a job. In September 1981, one week after entering the U.S., he responded to a Trimble ad for electrical engineers. Within 24 hours of submitting his resume, he



This small church (The Cathedral of God's Mother of Kazan) is located at the corner of Red Square, and was demolished by Stalin and replaced with public toilets. However, church leaders suspected that Stalin would do this, and maintained precise measurements and photos awaiting the day when they would be able to rebuild. As soon as Communism fell in 1991, this church was rebuilt in a short period of four years.

was working at Trimble Navigation, and was the third engineer (including Trimble himself) who was hired. He vividly remembers details of his interview with Charlie Trimble. Javad has tremendous respect for Trimble's dedication and credits him with making GPS a commodity product. "I learned the spirit of entrepreneurship, dedication, and hard work from Charlie. He worked almost 7 days a week and there were nights that he worked until sunrise to burn EPROMS for manufacturing. "Iowa gave me the knowledge. Charlie taught me what to do with it," Javad says. It was not unusual to find Javad himself working long into the night. On several occasions, he experienced a "breakthrough" well past midnight, and giving no thought to the hour, quickly phoned Trimble with the news. Trimble never mentioned the inappropriateness of the calling hour. Each team member shared a passion for work. With such dedication, their first project, scheduled to take three to four months, was completed in only two months.

This enormous church (The Cathedral of Christ the Redeemer) was also destroyed by Stalin, but like the small church pictured above, church leaders kept meticulous records. Nikita Khrushchev constructed the world's largest outdoor heated swimming pool (some 150 meters in diameter) on the site, but in 1991, the pool was demolished, and within five years, the church was rebuilt.

Long-awaited Family Reunion

But even with such success, Javad was still unable to rest until he could one day reunite with the family he was forced to leave behind. While the Hostage Crisis had lasted for 444 days, it took Javad 484 days to get them out of Teheran. Trimble paid for a ticket to Genoa, Italy to pick up his wife and two daughters who were scheduled to go there from Iran, but they were going through a similar process as Javad, and were not allowed to board the plane in Iran. He called an uncle who had a connection, and tried again two weeks later, all the while waiting in Genoa. His family finally was allowed to leave, but flights got mixed up and bad weather forced their plane to land in another city. After a lonely and lengthy separation, Javad was finally reunited with his wife, Mitra, and their daughters Nadia (born in Teheran, and then 3 years old) and Nedda (born in Iowa City, and then 10 years old). To add to the tension, on the flight back to the U.S., the plane had engine trouble and even had a flat tire upon landing in Los Angeles. Since then, Javad and his wife have had two more children: a son, Nema, and a daughter, Nusha, both born in California. Alluding to their ordeal, Javad draws parallels between their experiences and the movie, "Not Without My Daughter" starring Sally Field. His daughter Nadia is

now the financial officer for the company.

I asked Javad about influences in his life, and he credits his father, a businessman in Iran, for providing support and the "push" that gave him the drive to succeed. Sadly, his mother died in Iran during the time he was trying to get his family out of the country. He has one brother and two sisters. His brother received his PhD in thermodynamics from Stanford University and is currently a vice-president of engineering for a high-tech company in California. His sisters are both surgeons in Iran.

While seeking American citizenship, an immigration lawyer told Javad that his application would be much more favorably reviewed if he was working for a larger firm. Consequently he took a job at Intel, working daily from 9:00 to 5:00 , and continuing at Trimble from 5:30 to 2:00 A.M. Javad left Trimble Navigation in 1986 after a disagreement with Charlie Trimble. He considers this to be a dark spot in his life, and wishes it hadn't happened. He still feels that there are regrets on both sides.

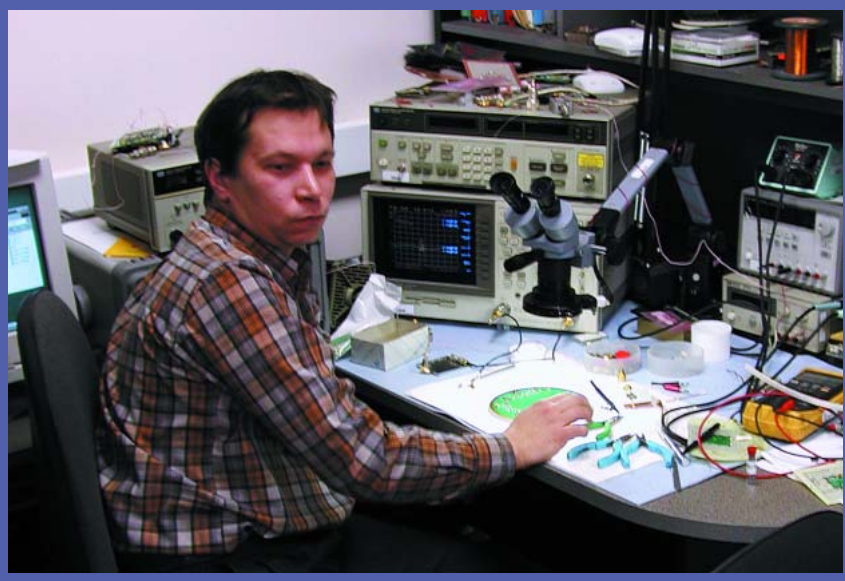
Early Business Ventures

After leaving Trimble, Javad attended an IEEE Position, Location and Navigation (PLANS) conference in Las Vegas and ran into a vice president from SAGEM, a giant French manufacturer of military, mechanical, and consumer electronics products. Javad was looking for funding to begin his own venture, and SAGEM needed a board for one of its navigation products. Javad spent the next month and a half in Paris responding to technical and financial questions from SAGEM and conducting negotiations. After the deal was signed the vice president admitted that it was not an accident that they ran into each other at PLANS because it was the purpose of his trip. Javad then returned to the United States to begin Ashtech, of which SAGEM was a 51 percent owner. He moved into an empty building on Aster Avenue in Sunnyvale. Once the shock of what he had done wore off, he went to the Price Club to purchase initial supplies and started hiring people. At the end of the first year, he had the board for SAGEM, and delivered it to Paris under time, and under budget. From there on and for the next 8 years under his direction, Ashtech was profitable with a compound annual growth of 45 percent. As the company grew, he moved to a location on Potrero Avenue, and then Kifer Avenue, each time doubling the amount of space.

At the time of the San Francisco Earthquake in October of 1989, Javad was at a Royal Institute of Navigation conference in London where he was approached by a group of Russian scientists from the Institute of Space Device Engineering. Based on technical articles the Russians had seen about the Ashtech reputation for high precision, the Russians wanted to talk to Ashtech about building a combined GPS/GLONASS receiver. Javad began traveling to Moscow and soon had 120 Russian scientists on the payroll.

SAGEM sold its share of Ashtech to Patricoff Investment Corporation, and Chuck Boesenberg was brought in to position Ashtech for an IPO. Javad and Boesenberg had drastically different philosophies on business and technology—and according to Javad agreed on only three things: their taste for Beluga caviar, Cohiba cigars, and Dom Perignon—and in 1996, Javad sold 3.5 percent of his 27 percent share of Ashtech to obtain funding for his newest company, Javad Positioning Systems (JPS). By the time he left Ashtech, there were 150 employees in Sunnyvale and 150 in Moscow. Ashtech was then sold to Magellan, and

Office scenes in Moscow.



Javad's proceeds from that sale funded the second phase of JPS. Javad still owns six to seven percent of Magellan, and is the largest individual private shareholder. JPS introduced its first product at ION in Nashville in 1998, and made a profit in 1999, its first full year in business. And the rest, as they say, is history.

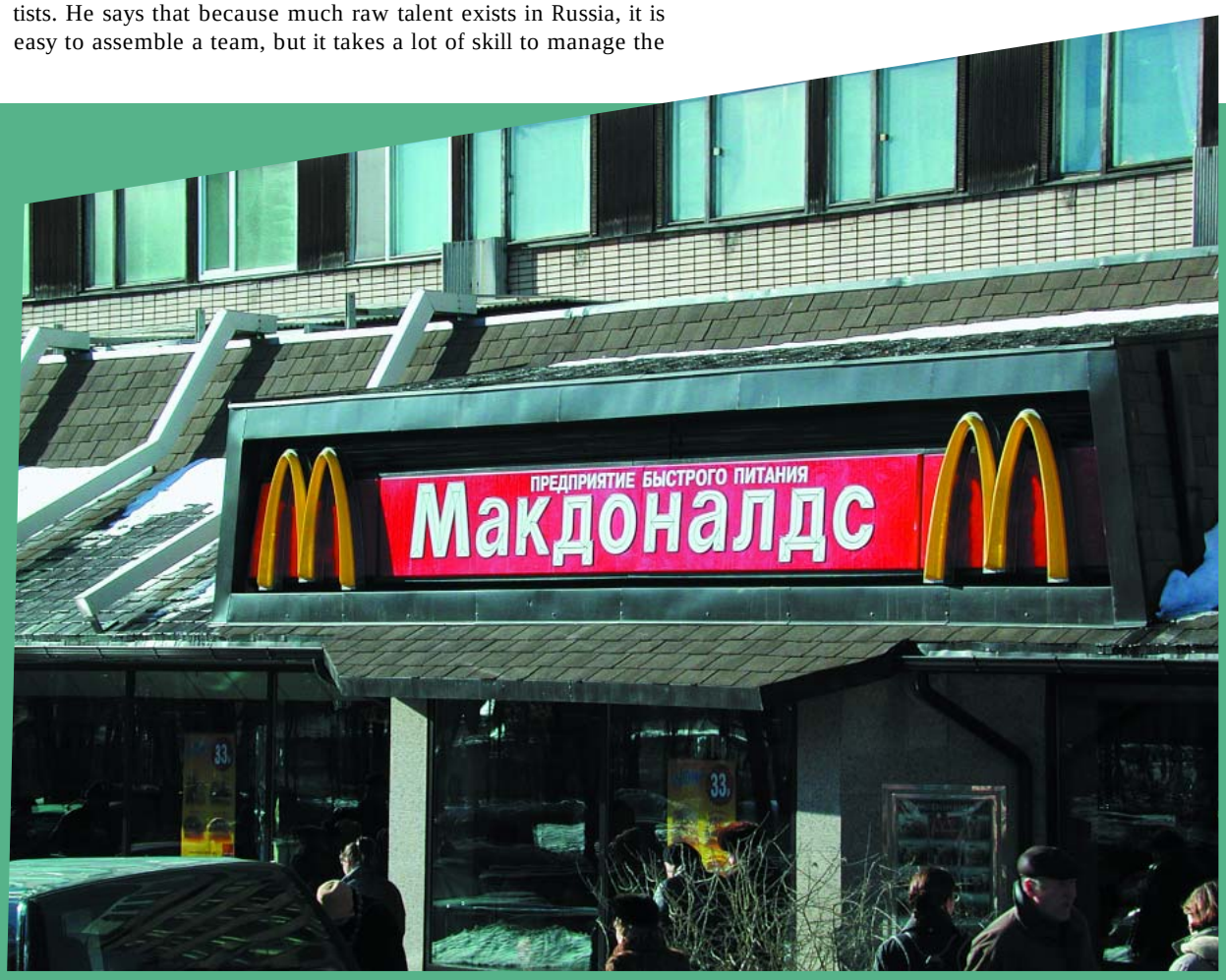
The limited acquisition of JPS by Topcon Positioning Systems (TPS) in July 2000, resulted in TPS owning the JPS technology for surveying, construction, commercial mapping, civil engineering, precision agriculture, land-based construction and agriculture machine control, photogrammetry, and hydrographic applications. Javad retained the ownership, access, and right to the technology for other markets. Javad is also committed to a 5-year employment contract to Topcon while pursuing the growth of Javad Navigation Systems in other markets and what Javad refers to as "fun things." It will be interesting to see what he comes up with.

Javad is convinced that the limited selling of JPS to TPS was the right decision. He said the dealers are excited and support the decision. "Of course, there are differences between the culture of JPS and the conservative nature of Topcon. But I believe that they can complement each other in creating a much bigger and global JPS/TPS company."

Javad grew the Moscow office to approximately 130 scientists. He says that because much raw talent exists in Russia, it is easy to assemble a team, but it takes a lot of skill to manage the team. One of the differences he has observed between American scientists and Russian scientists is that American scientists tend to possess "broad" knowledge, while Russian scientists tend to possess very "deep" knowledge about individual specialties with less focus on the "big picture."

Part 2

While gathering the necessary information for this article, I realized that I had neglected to get a picture taken of Javad and me at the conference in Salt Lake City. We tried to synchronize our schedules to get the photograph, but were unable to do so. Finally, I asked Javad to have one of his employees take a picture of him in Red Square in Moscow. We discussed it further and decided that it would be a splendid idea to have one of his people take a picture of him *and* me in Red Square! So, in February I traveled to Moscow. My brief four-day visit helped to dispel several misconceptions I had about Russia. As we drove from the airport, Javad told me that when he first came to Moscow in 1989, the only colors on the street on which we were driving were the traffic lights stretching out into the distance, and there was no traffic. Today, like any other metropolitan city in this country or abroad, the streets are choked with traffic and the shops and buildings lining the street are a riot of color. Unlike the drab gray buildings of the previous era, in which Communism seems to have stolen the souls of the architects, the older architecture in



Believed to be the largest McDonald's in the world, this restaurant occupies three floors and has 40 cash registers. There must have been a thousand people inside, all enjoying capitalist food.

Moscow shows a beautiful Italian influence, and many of the buildings have been refurbished and re-painted. Contrary to what many may believe, religion is alive and well in Russia, and believers no longer have to operate underground. Even though Stalin destroyed 300-400 churches, Moscow still contains hundreds of churches, both large and small.

The offices of Topcon Positioning Systems and Javad Navigation Systems occupy three floors of a new office building, which is joined to an upscale 20-story apartment building. Javad discussed the positive aspects of working in Russia, and the respect and friendship he has with his employees. This was obvious as we toured the office. The Moscow operation is responsible for advanced theoretical research about GPS and GLONASS, signal processing, and antennas. It consists of 12 working groups. The first, the antenna group, works on both communications and positioning, and consists primarily of electrical engineers. The second, RF and analog processing, works with the incoming satellite signals. The signals are amplified, filtered, down-converted, digitized, and finally, processed. The third group works on application-specific integrated circuits (ASIC) which process the digital signals. The fourth group works on microprocessors. Javad claims that his company is the only GPS company (among Intel, Siemens, Motorola and Hitachi) to design its own microprocessor. The fifth group works on firmware, which is the software that makes all the boards work together and combines the various processed signal information. The group is composed of mathematicians and software engineers. The sixth group is responsible for RTK, and develops the firmware inside the receiver. Javad receivers process both GPS and GLONASS signals for faster and better results.

The seventh group handles communications, which consists of a spread-spectrum radio modem inside the receiver. They also work with GSM technology The eighth group develops Javad's post-processing software, Pinnacle. The group includes people from the Russian equivalent of NGS, *Roscomzion* (Russian Committee on Land Management) This group is currently working on new GIS software. A ninth group handles testing, both in board and system level. Like all GPS companies, the roof of the building is festooned with antennas for this purpose. The tenth group handles mechanical design for the organization. Composed of mechanical engineers, this group designs the housings and board interconnects. While there I saw Javad's latest creation, a box with multiple antenna connections that can determine the attitude and heading of vehicle. The eleventh group handles manufacturing. The boards are made in California, and the housings are designed using state-of-the-art software, and designs are digitally transmitted to Taiwan for injection molding. The last group, support, handles technical writing for the manuals, and manages the Website. It also trains the dealers who provide phone support for the products.

The Lap of Luxury

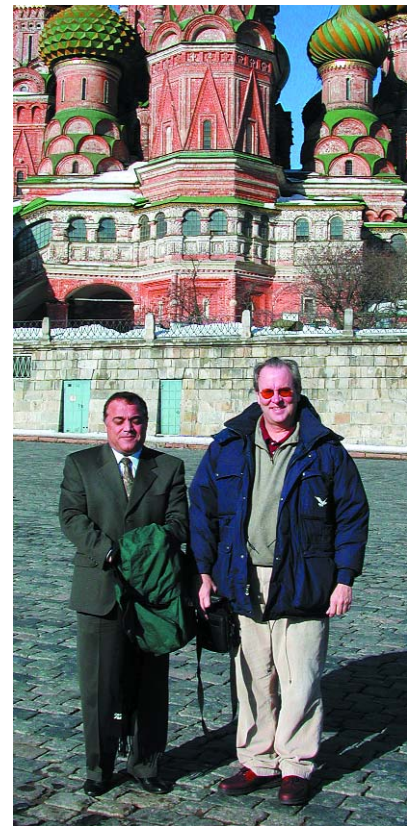
Twenty-one doors away, Javad's "flat" occupies parts of the 19th and 20th floors of the apartment building that is next to the office building. He enjoys a commanding view of Moscow from all sides of his flat. The flat is fully wired, with a T1 providing fast access to a critical component of his operation, the Internet. A large conference table occupies a meeting room. Yet there in his home, away from the preoccupations of day-to-day business, Javad finds time for his hobbies: photography (he has an impressive collection of Hasselblad equipment), and classical music (Herbert Karajan is his favorite composer). He is very humble about his successes, however, and freely admits that at this point in life he is living in the "lap of luxury."

Emergence Into a Democratic World

Fully fifteen percent of Russia's population are either scientists or engineers, and the real contribution Javad makes to his employees is that they get to do what they were trained to do. Many of the employees are former professors and many have written textbooks about their particular area of expertise. In a land that continues to struggle with the transition from Communism to a free society, Javad's accomplishments and contributions are laudable. He is not only providing many jobs, but the jobs he is providing are allowing his employees to do what they were trained to do. Javad's efforts are playing a part in Russia's emergence into a democratic world.

Upon concluding my interview, I asked Javad three questions: What is your prediction for the future of GPS? What do you feel is your most important accomplishment? Do you have a quote that you would like to share with our readers? He predicts that GPS will follow the path of other electronics: faster, cheaper and smaller. He believes that his most important accomplishment is to have had a hand in making precision GPS an affordable, portable device for surveyors. Javad is also very proud that he has received the rank of ACSM Fellow because he is an electrical engineer, not a surveyor. He concluded with this quote: "Those who think GPS technology has reached its maturation are showing the limits of their knowledge or imagination. We have a long way to go."

As someone who has been involved with the precise positioning aspects of GPS since the very beginning, Javad is considered by some to be a GPS genius. Certainly, he is the embodiment of the American Dream. He is not without detractors, but one thing's for sure: Javad Ashjaee has succeeded at everything he has set out to do, and his future is very bright. Perhaps Javad had an idea before he ever came to the United States of what the future held, but nobody could have predicted the path his life has taken. And the precise positioning community has benefitted from his passion for hard work and excellence.



Javad Ashjaee and editor Marc Cheves in front of St. Basil's Cathedral at the edge of Red Square.